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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,121	02/28/2005	Hiroto Kokubun	1141/72716	6064
23432 7590 10/05/2007 COOPER & DUNHAM, LLP 1185 AVENUE OF THE AMERICAS NEW YORK, NY 10036			EXAMINER BOR, HELENE CATHERINE	
			ART UNIT 3768	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/501,121	Applicant(s) KOKUBUN ET AL.	
	Examiner Helene Bor	Art Unit 3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 July 2007.  
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1-19 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
 10) ☒ The drawing(s) filed on 13 July 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) ☒ All b) ☐ Some \* c) ☐ None of:  
 1. ☐ Certified copies of the priority documents have been received.  
 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

The examiner recognizes the amendments to claims 1-19. Thus under examination are claims 1-19.

#### ***Response to Arguments***

1. Applicant's corrections filed 01/12/2007 for the specification, drawings and abstract are accepted. All objections to the specification, drawings and abstract are withdrawn.
2. The applicant's amendments filed 01/12/2007 to the claims in regards to the claim objections are accepted and all claim objections are withdrawn.
3. Applicant's arguments filed 07/12/2007 have been fully considered but they are not persuasive in regards to the 102(b) rejection of claim 1-5. The applicant states that the improvement to include detecting a static time phase with a small amount of motion artifacts in a predetermined portion of the subject based on heartbeat information acquired in association with the projection data. The examiner respectfully disagrees with the applicant in regards to the argument on pages 14 and 15 of the remarks that Lutz'051 does not teach the claimed invention. Lutz'051 does teach the claimed invention as the electrocardiograph and electrodes are connected to determine the cycle time of the cardiac rhythm of the patient (Col. 3, Line 38-40). The information from the electrocardiograph and electrodes is used for the control means for recording and storing measurements data from projections of various cardiac phases [such as the static phase or P-T phase]. Lutz'051 teaches the means for the reconstruction of the images of the respective cardiac phase (Col. 3, Line 44-47). Lutz'051 teaches detecting

means for detecting a static cardiac time phase (Col. 2, Line 25-30) in a subject based on heartbeat information acquired in association with the projection data (Col. 3, Line 27-32). Lutz'051 also teaches image reconstructing means for generating the tomographic image by reconstructing projection data corresponding to the static cardiac time phase detected by the detecting means (Col. 2, Line 52-58). Thus the 102(b) rejection of claims 1-5 is maintained.

4. Applicant's arguments filed 07/12/2007 have been fully considered but they are not persuasive in regards to the 102(e) rejection of claim 1-19. The examiner respectfully disagrees with the applicant arguments on page 16-17. Flohr'487 does teach detecting the static cardiac phase (Col. 2, Line 42-54) with heartbeat information [wherein the ECG signal provides heartbeat information] (Col. 4, Line 8-21). Thus the 102(e) rejection of claims 1-19 is maintained.

***Claim Rejections - 35 USC § 102(b)***

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claim 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Lutz'051 (US Patent No. 5,832,051).

***Claim 1:*** Lutz'051 teaches an apparatus for generating a tomographic image (Figure 1, Element 1). Lutz'051 teaches reconstructing projection data acquired by scanning a predetermined slice of a subject (Col. 2, Line 38-41). Lutz'051 teaches detecting means for detecting a static cardiac time phase (Col. 2, Line 25-30) in a subject based on heartbeat information acquired in association with the projection data (Col. 3, Line 27-32). Lutz'051 also teaches image reconstructing means for generating the tomographic

image by reconstructing projection data corresponding to the static cardiac time phase detected by the detecting means (Col. 2, Line 52-58).

**Claim 2:** Lutz'051 teaches an apparatus wherein the detecting means detects the static cardiac time phase based on correlation data between the heartbeat information and the static cardiac time phase that are previously determined to each subject (Col. 2, Line 18-25).

**Claim 3:** Lutz'051 teaches an apparatus wherein the correlation data is prepared to each of different portions of the subject (Col. 2, Line 12-13), and the detecting means comprises input means for setting the predetermined portions (Col. 2, Line 44-46).

**Claim 4:** Lutz'051 teaches an apparatus wherein the correlation data includes at least a correlation between a heartbeat rate and static cardiac time phase (Col. 3, Line 38-47).

**Claim 5:** Lutz'051 teaches an apparatus wherein comprising memory means (Figure 1, Element 8) for storing the projection data acquired over a plurality of heart beat cycles and a projection data synthesizing means for reading the projection data corresponding to the static cardiac time phase detected by the detecting means and synthesizing the projection data, wherein the image reconstructing means reconstructs the projection data synthesized by the projection data synthesizing means (Col. 8, Line 28-33).

### ***Claim Rejections - 35 USC § 102(e)***

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Flohr'487 et al. (US Patent No. 6,381,487 B1).

**Claim 1:** Flohr'487 teaches an apparatus for generating a tomographic image (Col. 1, Line 6-7). Flohr'487 teaches reconstructing projection data acquired by scanning a subject (Col. 2, Line 13-25). Flohr'487 teaches detecting means for detecting a static cardiac time phase in a subject based on heartbeat information acquired in association with the projection data (Col. 2, Line 23-25). Flohr'487 also teaches image reconstructing means for generating the tomographic image by reconstructing projection data corresponding to the static cardiac time phase detected by the detecting means (Col. 2, Line 27-35).

**Claim 2:** Flohr'487 teaches an apparatus wherein that the detecting means detects the static cardiac time phase based on correlation data between the heartbeat information and the static cardiac time phase that are previously determined to each subject (Col. 2, Line 42-54).

**Claim 3:** Flohr'487 teaches an apparatus wherein that the correlation data is prepared to each of different portions of the subject (Col. 7, Line 19-21), and the detecting means comprises input means for setting the predetermined portions (Col. 7, Line 32-37).

**Claim 4:** Flohr'487 teaches an apparatus wherein that the correlation data includes at least a correlation between a heartbeat rate and static cardiac time phase (Col. 2, Line 23-25).

**Claim 5:** Flohr'487 teaches an apparatus wherein memory means (Figure 10, Element 11) for storing the projection data acquired over a plurality of heart beat cycles and a

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projection data synthesizing means for reading the projection data corresponding to the static cardiac time phase detected by the detecting means (Col. 2, Line 23-25) and synthesizing the projection data, wherein the image reconstructing means reconstructs the projection data synthesized by the projection data synthesizing means (Col. 2, Line 27-35).

**Claim 6:** Flohr'487 teaches an apparatus wherein the detecting means comprising a sample tomographic image rearranging means for generating a plurality of sample tomographic images having a different cardiac time phase based on the projection data and the heartbeat information and selecting means for selecting a sample tomographic image with a small amount of motion artifacts from the plurality of sample tomographic images, wherein the image reconstructing means generates the tomographic image by reconstructing projection data corresponding to the cardiac time phase of the sample tomographic image selected by the selecting means (Col. 2, Line 10-40).

**Claim 7:** Flohr'487 teaches an apparatus wherein that an image size of the sample tomographic image is set smaller than that of the tomographic image (Col. 7, Line 65 – Col. 8, Line 5).

**Claim 8, 9 & 10:** Flohr'487 teaches an apparatus wherein the selecting means calculates an integrated value of a CT value of each of the plurality of sample tomographic images images having the different cardiac time phase in a predetermined region, and selects a sample tomographic image with a smallest fluctuation of the integrated value of the CT value and selects a sample tomographic image having a largest correlation (Col. 5, Line 53 – Col. 6, Line 7).

**Claim 11:** Flohr'487 teaches an apparatus wherein memory means for storing the projection data acquired over a plurality of heart beat cycles and projection data synthesizing means for reading the projection data corresponding to the cardiac time phase of the sample tomographic image selected by the selecting means and synthesizing the projection data, wherein the, the image reconstructing means reconstructs the projection data synthesized by the projection data synthesizing means (Col. 2, Line 27-35).

**Claim 12:** Flohr'487 teaches an apparatus wherein that the sample tomographic image generating means generates the plurality of sample tomographic images in a predetermined cardiac time phase range determined based on the correlation data between the heartbeat information and the static cardiac time phase that are determined previously (Figure 11).

**Claim 13:** Flohr'487 teaches an apparatus wherein that the correlation data is prepared to each of different portions of the subject (Col. 7, Line 19-21), and the detecting means comprises input means for setting the predetermined portions (Col. 7, Line 32-37).

**Claim 14:** Flohr'487 teaches an apparatus wherein that the correlation data includes at least a correlation between a heart rate and a static cardiac time phase (Col. 2, Line 23-25).

**Claim 15:** Flohr'487 teaches an imaging method of generating a tomographic image (Col. 1, Line 6-7) by reconstructing projection data acquired by scanning a predetermined slice of a subject, detecting a static cardiac time phase with a small amount of motion artifacts (Col. 2, Line 55-57) is detected in a predetermined portion of



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the subject based on heartbeat information acquired in association with the projection data (Col. 2, Line 23-25) and generating the tomographic image by reconstructing projection data corresponding to the detected static cardiac time phase (Col. 2, Line 27-35).

**Claim 16:** Flohr'487 teaches an imaging method wherein that correlation data between the heartbeat information and the cardiac time phase from each subject, and the static cardiac time phase is detected, based on the correlation data (Figure 11).

**Claim 17:** Flohr'487 teaches an imaging method wherein a plurality of sample tomographic images having a respective different cardiac time phases based on the projection data and the heartbeat information, selecting a sample tomographic image with a small amount of motion artifacts from the plurality of sample tomographic images, and using a cardiac time phase corresponding to the selected sample tomographic image as a static cardiac time phase (Col. 2, Line 13-27).

**Claim 18:** Flohr'487 teaches an imaging method wherein that an image size of the sample tomographic image is set smaller than that of the tomographic image (Col. 7, Line 65 – Col. 8, Line 5).

**Claim 19:** Flohr'487 teaches an imaging method wherein that correlation data between the heartbeat information and the static cardiac time phase are from each subject (Figure 11) and generating the plurality of sample images in a predetermined cardiac time phase range determined based on the correlation data (Col. 2, Line 27-35).

***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helene Bor whose telephone number is 571-272-2947. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eleni Mantis-Mercader can be reached on 571-272-4740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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hcb

  
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